TOWN OF SOUTHAMPTON

WIRELESS COMMUNICATIONS PLAN

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I. Introduction

The Town of Southampton's 1999 Comprehensive Plan Update included a goal to *"Help residents capitalize on the telecommunications revolution by easing the ability of people to work out of their homes, and thus invest in and bring jobs to Southampton."*

The telecommunications revolution continues, as applications expand from mobile phone service to music, photos, video and computing. Access to wireless has shifted from luxury to necessity.

The purpose of this Wireless Communications Master Plan is to fulfill the Comprehensive Plan goal of facilitating the spread of wireless service while also planning to protect the Town from the impacts of the proliferation of antenna support towers and other types of facilities.

Increasing use of wireless technology increases the need for transmission facilities.

The rapid consumer acceptance of wireless technology has resulted in the proliferation of wireless communications facilities, which have the potential for adverse impacts on Southampton's scenic qualities. As more on more people come to rely on wireless communications — particularly second home residents seeking to increase the amount of time they spend here by conducting business remotely — the Town of Southampton must evolve its policies and regulations for accommodating the wireless industry while protecting the visual resources integral to the Town's character and economy.

The need for new locations for wireless facilities is not going to stop any time soon. Trends for increased number of users and longer calls will exceed the capacity of existing facilities, thereby requiring more locations. The development and expansion of new services and applications, such as e-mail, photo messaging, Internet use, video transmission, WiFi, etc., also add demands on the system that will result in the need for more and more wireless communications sites.

Changing conditions and new technologies affect facility siting requirements.

Wireless telephone usage has shifted/expanded from primarily people in cars to people where they live and work. As a result of this shift, coverage is important beyond the main roads that had initially been the focus of wireless communications activity. Increasingly, new facilities will be required to serve residential areas.

However, as the number of sites increase, the area served by each site can decrease and new facilities may not require the obtrusive height of "traditional"

towers or rooftops. Visual impacts may be mitigated by siting facilities on structures that were not considered "suitable" in the past, such as existing streetlights or low-rise buildings.

The impacts of wireless communications facilities in the Town of Southampton will be addressed through regulation, policies and design guidelines.

In November of 1998, the Town of Southampton added Article XXVII to its zoning code, regulating the siting and design of *Wireless Telecommunications Towers and Antennas*. Less than a decade later, the industry's rapid expansion and changing technologies led Town officials to recognize those regulations needed to be updated — and augmented with a Wireless Communications Master Plan. To that end the Town contracted with the law firm of Miller & Van Eaton, PLLC, offering specialized services in communications law, and Comp Comm, Inc., an independent wireless communications engineering consulting firm to provide legal and technical expertise.

The Plan was developed with input from wireless carriers known to be providing service in Southampton, and also from the independent municipalities within the Town. Since each incorporated Village has the authority to establish its own zoning regulations and rules for wireless site approval, the Town of Southampton does not directly control antenna siting in these municipalities. However, because the jurisdictions are so closely integrated geographically, cooperation is to each municipality's advantage. The updated ordinance provides for such coordination as part of the review process.

The Town's Wireless Communications Master Plan includes:

- An overview of issues concerning the siting and design of wireless communications facilities, including a glossary of technical terms;
- An inventory of existing wireless communications structures and buildings in the Town and along its boundaries, upon which wireless antennas are currently mounted;
- An analysis of current network deployment patterns, identifying likely weak coverage areas;
- A discussion of administrative issues concerning the processing of applications for wireless facilities, leasing municipal sites and monitoring facilities;
- Recommendations for managing the development of wireless structures through regulatory and administrative measures;
- A proposed zoning ordinance update providing requirements and standards for location and design;
- A standard master ground lease for use of Town-owned sites for antennas;

- A comprehensive set of maps showing existing and potential locations of wireless communications facilities, approximate coverage areas by carrier, Town zoning, and environmental conditions that may affect the siting of facilities (e.g. critical environmental areas, aesthetic resources, etc.).

II. Wireless Communications Planning Goals

Southampton's Wireless Communications planning efforts have the following goals:

1. **Facilitate access** to reliable wireless communications services throughout the Town of Southampton.
2. **Protect community aesthetics** by planning for well-sited and well-designed wireless service facilities that fit unobtrusively in the Southampton environment.
3. **Manage the placement** of all communication antennas, antenna support structures, buildings, and associated equipment so as to promote efficient service delivery and avoid unnecessary proliferation
4. **Ensure the safety** of wireless communications facilities and avoid potential damage to people and property.
5. **Guide decision-makers and Town staff** by providing a policy framework and design guidance for decisions about wireless service facilities.
6. **Assist wireless companies with information** useful in their facility deployment process.
7. **Provide information for reference by the general public** regarding wireless service facilities and the community's design expectations, so as to improve the public's involvement and participation in the decision-making process.
8. **Ensure compliance** with all applicable state and federal laws.
9. **Offset the increasing costs of application processing,** and site monitoring inspection of wireless facilities in the Town.

A number of these goals — i.e., #5, to guide decision makers, and #7, provide information to the public — are addressed in large part by this document itself. Others are treated in the updated wireless telecommunications ordinance intended to result from this Plan, while still others are addressed through policy initiatives. Recommended Town policies regarding the design, installation and management of wireless communications facilities, along with implementation strategies, are given in Chapter VII below.

III. Wireless Communications Basics

As technology changes and expands, it is practical to use appropriate, and sometimes broad, terminology in discussing wireless communications facilities.

An example of the consequence of using narrow or imprecise terminology is the case where a community implemented an ordinance for "cellular towers" and was later prevented by the Courts from applying its provisions to the installation of a tower supporting PCS antennas. Southampton's existing ordinance regulates "wireless telecommunications tower[s] or antenna[s]." This plan, and its associated code amendment, is intended to cover the full range of wireless communications technologies and transmission installations, as described below. Generic terminology such as "site," "installation" and "facility" is therefore used to encompass both tower support structures, antennas and other transmission equipment, and associated base station equipment. The term "communications" is used instead of "telecommunications" to include WiFi and other communications technologies primarily concerned with data transmission in addition to cellular, PCS and other services that involved both voice and data.

Wireless communications applications and transmission technologies continue to evolve. Services currently include:

- Paging systems. These were the first large-scale public wireless telecommunications systems in the U.S., starting in the early 1970s.
- Cellular Phone Service. Initially analog, most cellular networks have converted to digital transmission and extended services beyond voice calling to include messaging, photo and video, e-mail, etc.
- PCS systems. PCS stands for Personal Communications Service ("PCS"), and bundles services such as e-mail and web browsing. Such multiplicity of uses is causing the term "phone" to yield to "wireless device." PCS networks are all digital.
- ESMR service. ESMR stands for Enhanced Specialized Mobile Radio, a digital service typically used for fleet telecommunications (i.e. radio dispatch) but which has been expanded for use in commercial services similar to cellular and PCS. To most end users, cellular, PCS and ESMR are functional equivalents and indistinguishable.
- WiFi & WiMAX Internet access. WiFi and WiMAX are not specific technologies but rather a certification mark, or 'stamp of approval' given to equipment that meets certain conformity and interoperability tests for the IEEE 802.16 family of standards. However, both names have been adopted in popular usage to denote the technologies behind them, probably due to the difficulty of using terms like 'IEEE 802.16' in common speech and writing. Both WiFi and WiMAX connect computers to the Internet using radio waves instead of telephone landlines or cable. WiFi technology is very short-range, in contrast to WiMAX which allows

for high-speed networking across much wider geographic distances. Some cellular phone companies are evaluating WiMAX as a means of increasing their capacity for data-intensive applications such as video transmission.

WiFi and WiMAX communications differ from paging, mobile phone and ESMR systems in that they require connection to an Internet Service Provider (ISP) rather than a telephone network. The technologies are newer and have not traditionally been the focus of municipal wireless telecommunications ordinances, particularly as WiFi installations are for the most part smaller and may be less visually obtrusive than installations supporting mobile telephone service antennas. In fact, most existing WiFi installations are located inside private homes and offices, allowing wireless Internet access to laptop and notebook computers being moved from room to room in a limited environment. However, new efforts to provide WiFi access extensively in the public realm, known as municipal or muni WiFi when initiated by local governments, involve larger networks with multiple installations. So what wireless telephone and wireless Internet have in common, and what makes it appropriate to plan for them jointly, is the installation of transmission equipment — e.g. antennas, radio transmitters — in the public realm.

Please note that discussion of WiFi in this document refers to large-scale public WiFi networks and does not apply to private home or office installations.

Wireless communications are transmitted through the air via radio waves of various frequencies.

The Federal Communications Commission (FCC) is empowered by Congress to regulate the communications industry in the United States — including wireline, wireless, broadcast (radio & TV) and certain elements of the Internet. It designates different portions of the radio frequency (RF) spectrum for different purposes, and licenses specific frequencies to be used for various wireless communications services. Just as an FM radio station is licensed to broadcast on a certain frequency in a particular area, wireless communications companies are licensed to use particular frequencies for specified purposes over specified geographic areas. The type of wireless services a commercial mobile service company may provide is generally defined by the terms of its FCC license.

The following table provides the different radio frequency ranges used by various wireless communications services. It should be noted that the frequency ranges used by WiFi and WiMAX are considerably higher than the frequencies used for "functionally equivalent" phone, paging and ESMR services. The higher frequency allows the signal to carry more data in a given timeframe. The frequencies used by WiFi are, by definition, unlicensed. WiMAX is generally used on frequencies licensed for commercial voice and data services.

The Town of Southampton currently licenses several VHF and UHF frequencies for use by its Radio Communications System for public safety and emergency services. These are in the 154.8-158.9 MHz and 453.2-458.8 ranges. New York State is attempting to create a State-wide, public safety frequency. When achieved, it will function as a single

shared radio network that allows local agencies to function independently during day-to-day operations, yet can achieve interoperability during a crisis such as an extreme weather or terrorist event. Once the system is operational, the Town of Southampton will purchase a patching system to marry its present communications system with the new State system.

Table 1
Radio Frequency Ranges used by Wireless Telecommunications Services

Service Name	Service Type	Frequency Ranges
Paging	low speed data	35, 43, 152 and 931 MHz
Cellular	voice, data	824-849 and 869-894 MHz
ESMR	voice, data	806-824, 851-869, 896-901, 935-940 MHz
PCS-Narrowband aka 2 way paging	low speed, low volume data	901-902, 930-931, 940-941 MHz
PCS-Wideband aka "PCS" (cellular)	voice, data	1850-1990 MHz (1.85-1.99 GHz)
WiFi	high-speed data, VoIP	2.4 GHz or 5GHz
WiMAX	high-speed data, VoIP	2 GHz to 66 GHz

There are plans at the FCC for licensing other pieces of the RF spectrum for other emerging wireless applications. As a result, there could eventually be ten or more companies operating wireless communications networks in a given geographic area.

The Radio Frequencies used by phone and paging services require relatively unobstructed paths from transmitter to receiver.

They do not travel well through physical objects such as buildings or hills. Because of this, base station antennas generally need to be located higher than surrounding built and natural features. They may be mounted on an existing tall structure (e.g. building roof, water tower, etc.) or, when none is available, a specially-built structure such as a tower will be used.

WiMAX networks also rely on line-of-sight, tower-style mounting, while the shorter-range muni WiFi utilizes a "mesh" network consisting of dozens or even hundreds of short-range radio transmitters that may be situated much lower — commonly on street lamps or traffic signals. This is not to say that WiFi installations never require the height that other wireless communications facilities do. In large-scale public WiFi, signals hop from one receiver to another until they reach a node that has a wired connection to the Internet. These "backhaul" nodes are typically antennas placed on tall buildings or towers.

Antenna towers are generally the most visually obtrusive aspects of wireless communications facilities and consequently are the objects of most concern — and the major focus of regulation. Their height is typically expressed as "AGL" or "above ground level," the measurement from the natural grade of a site to the highest point of a structure.

Wireless communications facilities are more than towers.

In fact, they may not include a tower at all. Typically, though not universally, wireless communications facilities include the following components:

- An antenna or antenna array to transmit and receive the wireless signals;
- A support structure — this may be a tower, a pole, an existing building or other structure on which antennas or other transmission devices are mounted;
- Associated equipment (transmitters, computers, power supplies, etc.) to run the facility and process the signals — sometimes referred to as "base station equipment". This equipment may be enclosed in shelters or cabinets;
- Cabling to carry signals to/from the base station equipment to the antenna(s).
- Connection(s), or feed lines, to the local cellular switch and onto the broader wireline phone network. WiMAX tower connections will be connected to an ISP network instead. As noted, not all WiFi installations will require a wired connection to the Internet.

Carriers may or may not own the sites where their facilities are located. Most often, they lease space on and near a tower, building or other support structure. Some applications for site development may involve three parties — the carrier, the owner of the support structure, and the owner of the property on which the structure is located.

As discussed below, several carriers may co-locate antennas on a single support structure. However, each service on a collocation is considered a separate facility.

Comp Comm, Inc.

Base station equipment and feed connections

Wireless communications facilities are sited to achieve maximum coverage, generally in a "honeycomb" pattern

Cellular, ESMR and PCS operate by transmitting and receiving radio frequency (RF) signals between a stationary antenna (the "site") and a mobile unit (such as a cell phone), which also has its own small antenna. RF waves transmitted from an antenna decline in strength, or attenuate, as they travel farther from the transmitting antenna. Therefore, any one antenna can only transmit and receive signals in a limited geographic area, often called the range or coverage area of that antenna. This is the same principle that causes a listener to lose a radio station on a car radio as the listener drives farther away from its source. As a mobile unit travels — for example, when a user is driving down a highway — transmission is "handed off" by the system from one stationary site to the next, as shown in Figure 1 below.

To enable call hand-off, the coverage of one stationary site will overlap with the coverage of the neighboring site. If there is no overlap, the call will be dropped as the mobile unit leaves the coverage area of one site without being close enough to be picked up by the next. The ideal wireless telecommunications network therefore looks like a honeycomb, where each site and the area it covers represents a "cell" and with adjacent sites providing seamless – unbroken – coverage over the extended area. Good system coverage and poor system coverage are illustrated in Figure 2 on the following page

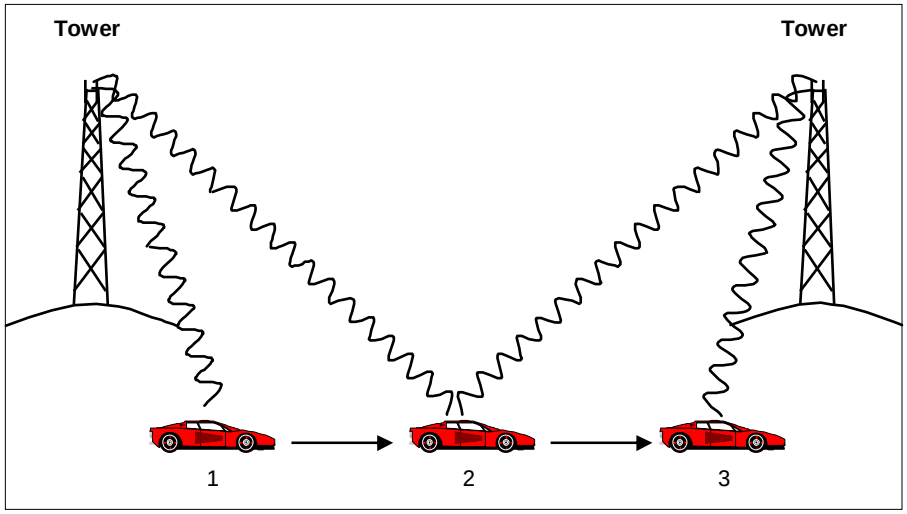


Figure 1. Call Hand-Off Between Sites

The phone in the car at position 1 is "talking with" Tower A. As the car approaches position 2, the phone begins to pick up the signal from Tower B. Tower A and Tower B "talk with" each other and decide who has the best connection with the phone in the car. As the car approaches position 3, Towers A and B have agreed that Tower B has the better connection, and Tower A instructs the phone in the car to begin "talking with" Tower B and drop its connection to Tower A. The call itself continues without interruption.

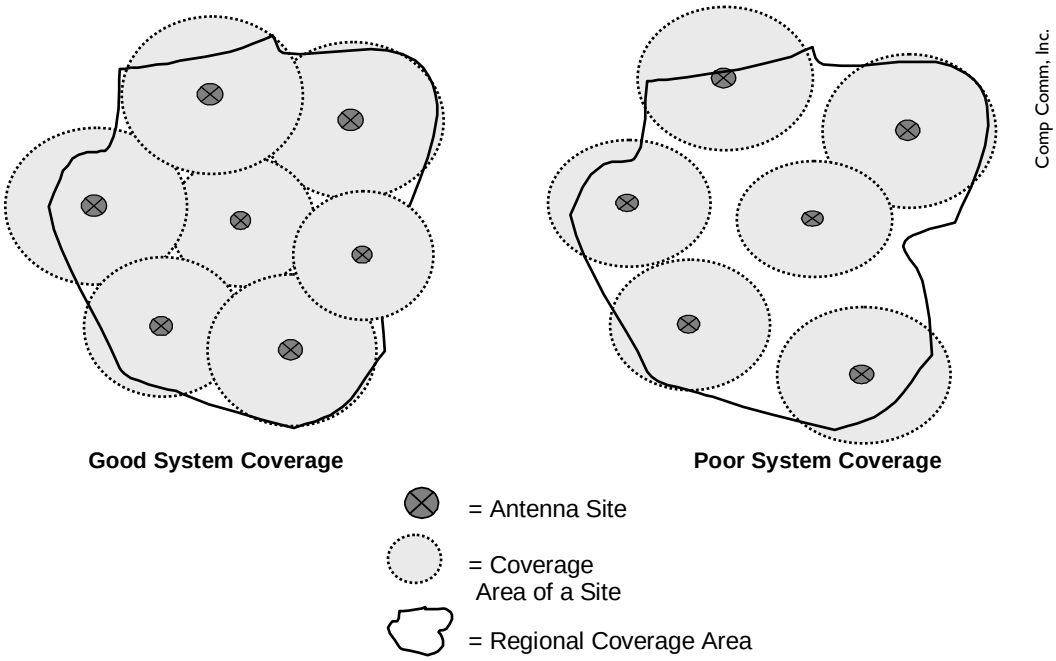


Figure 2. Conceptual Diagram of Good and Poor System Coverage

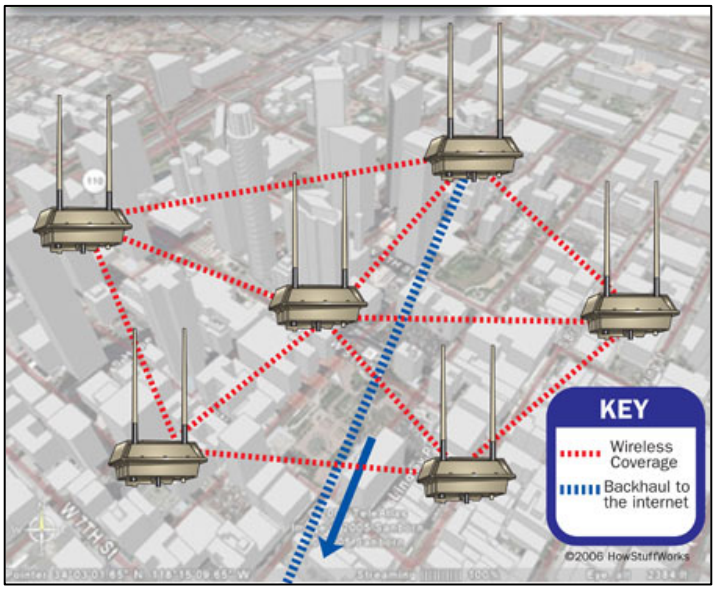


Figure 3. Conceptual Diagram of WiFi Mesh Network

In muni WiFi, transmitters are typically deployed in a "mesh" pattern, shown in Figure 3 on the previous page. Information hops from one radio transmitter (mesh node) to the next, automatically choosing the quickest and safest path in a process known as dynamic routing. As mentioned, one node in the mesh network needs to be physically wired to an ISP connection. The more nodes, the further the connection spreads, creating a wireless "cloud of connectivity" that can serve a small office or a large geographic area.

Wireless telecommunications service coverage is not static.

Most wireless communications service providers (PCS, cellular, ESMR) have already established their initial networks of cell sites. In this "Coverage Phase," facilities were established primarily along highways and other major transportation corridors — the focus of "mobile" communications. As usage patterns changed, networks expanded to provide wireless service more ubiquitously, where people work and live. Now companies have entered the "Capacity Phase," adding facilities to fill gaps in their coverage and increase capacity in high demand areas.

Capacity is the amount of radio traffic, or number of calls, a wireless system can handle simultaneously. A single site has only a finite number of channels that can handle calls. The wireless network reaches design capacity as more customers in an area subscribe to the service, use their devices more often, or as mobile devices become more technologically advanced and more data is transmitted — as in video or wireless Internet services. The service carrier may seek to increase network capacity by:

1. reconfiguring existing antennas or adding more antennas, if possible;
2. adding more radios (transmitters) to an existing base station if there is unused frequency capacity (rare);
3. adding additional frequencies, or
4. adding additional cell sites.

Options one and two are used first, and the change is rarely apparent to the observer. The third option is seldom used because it requires obtaining additional frequencies (licenses), which are very expensive or may not be available. Because the number and range of available frequencies are the main limiting factors for wireless network capacity, capacity needs are most often addressed through item four, adding new sites and "re-using" the allocated frequencies in each smaller geographic area.

An example of how changing communications technology and usage leads to the need for updates is the Town of Southampton's Radio Communications System, used by public safety and emergency services providers, which was replaced in 2003. More than 30 years old, the original system was designed to provide coverage from high powered mobile radios rather than the hand held portable radios used now. Signals were transmitted from just two antenna sites, leaving the fringes of the Town uncovered. The configuration also had problems with noise and reliability.

The recent upgrade by Motorola used several of the techniques mentioned above — antennas were replaced on existing sites in Noyack and Peconic Hills to take advantage of new technology, channels were added, and a new antenna support tower was built behind Police Headquarters. To achieve Town-wide hand held public safety coverage, the system now has three transmitter sites and one receiver only site.

New cell sites are usually interspersed with the existing sites, with each using its frequencies over a smaller geographical area, so that the system as a whole can carry more calls simultaneously. Because these "Capacity Phase" installations tend to service smaller geographic areas than installations deployed in the "Coverage Phase," height requirements may be lower and there may be more flexible options for siting them.

Public access wireless Internet is in its infancy at the time this plan is being prepared and may be considered in the "Coverage Phase." An initiative by Suffolk and Nassau Counties to establish WiFi coverage throughout Long Island is discussed below in Chapter VI of this document, which describes Existing Conditions concerning the development, management and monitoring of wireless telecommunications facilities in the Town of Southampton. The effort is in the active planning stage, and Suffolk County has requested a list of potential sites for transmitters to be placed throughout the Town.

How Stuff Works

Public WiFi transmitter

Applications for wireless service facilities may originate with service providers, builders and owners of antenna support structures (i.e. towers), or owners of the site.

Sometimes all three — service provider, support structure owner, property owner — are the same entity but that is not typically the case. During the initial coverage phase of mobile phone service antenna support towers were occasionally built "on spec" with the expectation that space on the towers would be leased to service providers, thereby justifying the investment. When such speculative structures could not be leased, communities were left with unnecessary eyesores, or towers taller than they needed to be. In response, some communities enacted regulations prohibiting speculative towers by requiring applicants to demonstrate that the proposed facility will be utilized for its intended purpose.

The Federal Telecommunications Act of 1996 both preserves and limits the authority of local government to regulate personal wireless service facilities.

47 U.S.C. § 332(a)(7)(A), added by Section 704 of the Act, states:

> *Except as provided in this paragraph, nothing in this Act shall limit or affect the authority of a State or local government or instrumentality thereof over decisions regarding the placement, construction, and modification of personal wireless service facilities.*

This same section (332) also sets forth the limitations of that local authority:

1. Local authorities can't discriminate among carriers of "functionally equivalent" services. For example, if cellular carriers already have facilities in the area, additional or new carriers of similar services — such as PCS — can't be prohibited, but should be allowed under the same rules that govern existing services. Similarly, if three PCS carriers are operating in an area, a fourth can't be excluded by the local authority simply because they feel that three carriers are sufficient. It should be noted that Cellular, PCS, ESMR and Paging are treated in essentially the same way by the Act of 1996, and should receive the same treatment by local government.
2. Local authorities can't reject all wireless communications services (i.e. facilities) completely, nor "have the effect of prohibiting" wireless services, for example by enacting excessively restrictive zoning ordinances.
3. Local authorities shall act on any request for authorization to place, construct, or modify wireless service facilities within a reasonable period of time after the request is filed.
4. Local authorities shall put any decision to deny wireless service facilities into writing, supported by substantial evidence contained in the written record.
5. Local authorities can't reject a request for wireless facilities based on health concerns if the facilities meet the FCC's regulations concerning radio frequency (RF) emissions. In other words, local rules can't be more stringent that Federal ones. Local authorities can require that carriers demonstrate compliance.

The law also provides for review in the courts or by the FCC of any decision by a zoning authority that is inconsistent with Section 704. Items 2 and 3 are why the Courts have rejected open-ended moratoria on antenna towers but generally allowed time-limited moratoria as long as the time limit is considered "reasonable." Item 5 was interpreted, on appeal, in *AT&T Wireless PCS vs. City Council of the City of Virginia Beach* to mean that health concerns could not be a reason for rejecting wireless facilities, but that the mention of such concerns by residents as part of the record was not fatal to the City's decision.

Some wireless carriers have also sought protection from local zoning authority under 47 U.S.C. § 253, the "barriers to entry" provision, which provides that "[n]o State or local statute or regulation, or other State or local legal requirement, may prohibit or have the effect of prohibiting the ability of any entity to provide any interstate or intrastate telecommunications service." In many respects, the legal restrictions on local communities under Section 253 are broader than those of Section 332(c)(7). While the latter forbids unreasonable discrimination among *wireless* telecommunications providers, Section 253 protects *all* telecommunications service providers in the public rights-of-way, both wireline and wireless. Thus, if relatively cut-and-dried administrative procedures are used to approve wireline carrier installations in the public rights-of-way, wireless competitors may complain about complicated, time-consuming procedures for comparable wireless communications facilities. Regulations for review and approval of wireless sites should be compatible with Section 253 as well as Section 332(c)(7) of the Federal Telecommunications Act.

IV. Issues in Siting & Designing Wireless Communication Facilities

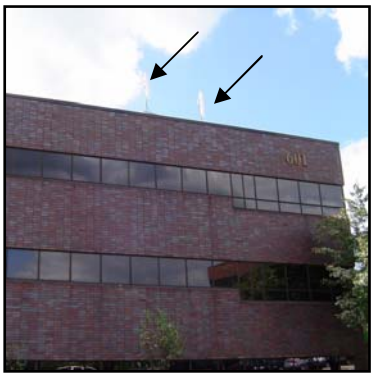
Antenna height is a determining factor in the location, siting and design of a wireless service facility

Because the radio frequency signals used for wireless telecommunications are "line-of-sight" signals, coverage can be thought of somewhat analogously to light. An empty room may be completely lit with a tall lamp in the center, but if the room contains furniture, there will be shadows in some areas. The light will not adequately reach places it could if there were no obstacles, and more light sources may be needed to provide good illumination throughout the room. Similarly, if an antenna is placed next to (and lower than) a nearby hill or building, transmissions from that antenna may be blocked from the far side of it and an additional site might be needed to provide a strong enough signal in the "shadowed" area.

Communications shadows can be created by such obstacles in the landscape as hills, trees, buildings and even mobile sources such as cars and trucks — in short, anything that stands between the base station antenna and the mobile unit. Consequently, wireless companies typically seek approval for antenna heights that are above obstructions.

Antenna height can be achieved in two ways:

1. Locate the antenna on an existing tall structure such as church steeples, water towers, light poles, utility structures, flagpoles and buildings. Building-mounted antennas may be installed either on the roof or side of the building, given sufficient height. Location on existing structures is the preferred option, as it generally minimizes visual and land use impacts.
2. Erect a "purpose-built" structure — that is, a structure built specifically to support wireless telecommunications antennae. Lattice towers and monopoles are the most commonly used types of purpose-built structures for wireless facilities. Either type may be "guyed" for greater stability, by placing support cables (guy wires) to connect high points on the tower or pole to anchors in the ground.



Comp Comm, Inc.

Roof-mounted antennas

Comp Comm, Inc.

Antennas mounted on a telephone pole

Lattice towers are typically between 70 to about 200 feet, but can be much taller, particularly when guy wires are used, and when there is a substantial base to support the tower's weight and provide stability. Among the lattice towers in Southampton whose heights are on record, the tallest is 327 feet, on David

White's Lane in North Sea. Monopoles have become popular alternatives in recent years because they are considered less visually intrusive than lattice towers. They can also be cheaper and easier to build, though this is not always the case. Free-standing monopoles generally get as tall as 200 feet, but, as with lattice towers, the taller the monopole, the larger and stronger the foundation needed to support it. This support is either in the form of a concrete block buried in the ground, or consists in a "direct-embedded" pole that is driven twenty feet or more into the ground, depending on soil structure and other variables. A variant on the monopole is the "unipole," which uses "low-profile" or "flush-mounted" antennas to achieve the look of a flagpole. (See Attachment VI for images and information on different antenna types.)

Collocation is often used to minimize installations, but can increase their visual impact.

Antennas servicing different carriers may be placed together — collocated — on the same support structure. Typically a lattice tower or monopole will support the antennas of three wireless service carriers, although four or five may sometimes be accommodated. Several towers and monopoles in Southampton support antennas from all five carriers operating here.

Comp Comm, Inc.

Monopole mount hosting two providers

Many communities prefer, and some require, collocation of new antennas on an existing tower in order to minimize visual and land use impacts. Wireless communications carriers co-locate equipment because it can be efficient and cost effective. However, when antennas from different carriers collocate on a single support, they must be separated — typically by a distance of 10 feet. As a result, towers hosting antennas from multiple carriers need to be taller and stronger than towers hosting only one carrier. Communities must consider the trade-offs between fewer facilities and more facilities that may be less obtrusive.

Comp Comm, Inc.

Tree-style monopole

Techniques are available to disguise purpose-built structures

"Stealth" technology camouflages towers and monopoles to make them blend in with their surrounding or appear more aesthetically pleasing. Options include structures made to look like trees, signs, flagpoles, fire towers, water towers and similarly tall structures that are more acceptable and familiar than standard telecommunications antenna supports.

Another option is to add an architecturally compatible "bump-up" on an existing building to host and hide antenna mounts. In these instances, the wall or façade is

replaced with RF-transparent materials so that wireless telecommunications antennas are entirely hidden from view, but their operation is not impeded. It is possible to drive past such antennas and never know it.

A number of companies specialize in designing and building stealth facilities, and they can be creative. However, stealth techniques are not typically employed unless a community requires them because they are more expensive than a basic lattice or monopole. Some camouflage efforts are more successful than others. For example, "tree-poles" or "monopines" — monopoles designed to appear like a tree — often tower above and consequently fail to blend in with neighboring vegetation. Architectural extensions must match the existing building's style, scale and quality in order to succeed.

Because stealth installations work with existing structures, their height is going to be limited to that of a reasonable extension. A rooftop cupola, for example, can only be so much taller than the building beneath it. Accordingly, stealth projects sometimes require a compromise in the height of antenna installation, which in turn can reduce the size of its service area, thereby requiring additional sites in the network to provide the same level of overall system coverage. As with collocation, camouflage or stealth installations may involve a trade-off between siting fewer facilities on taller structures and having more facilities that are less visually obtrusive.

All photos , Steal Concealment Solutions, Inc.

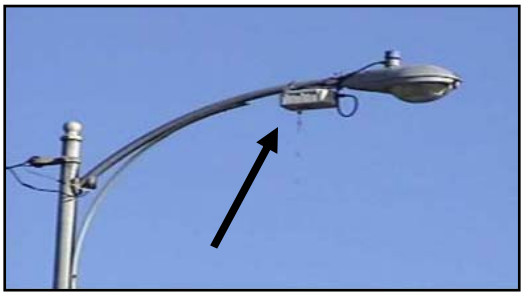
Stealth installations include cupolas, flagpoles, and "chimney" additions.

Capacity Phase installations may be lower in height and smaller

As noted, infill installations of wireless telecommunications facilities address smaller geographic areas and may consequently be smaller and/or lower. Light standards, traffic signal poles, utility poles, signs, flag poles and similarly tall structures, most often located in the public right-of-way, become feasible options.

New technologies, such as DAS (Distributed Antenna Systems) and micro- or picocell configurations, also have the potential to provide unobtrusive coverage. These systems consist of networks of multiple small sites, each covering a small area, perhaps having a ¼ mile radius or less. While promising from a visual perspective, they require many individual installations, and often sites along a roadway will not reach residential areas or businesses with deep set backs. Additionally, these solutions are currently less popular with service carriers, as the increased number of sites required drives up the cost of covering an area.

Replacing single band with dual band antennas capable of operating at both cellular and PCS bands simultaneously can also increase carrier capacity. However, this is only possible when the carrier owns licenses in both bands. As discussed above, licenses may be acquired either when the FCC licenses new spectrum, or when existing licenses are offered for sale. Both these options have limited availability and high associated costs.



Comp Comm, Inc.

Small antennas may be mounted on streetlamps, like the DAS shown above.

Facility design must also provide for the equipment associated with a wireless telecommunications antenna

Associated equipment may be located in its own building or enclosure near the antenna support structure, or — if the antenna is on a building — may be placed on the roof or elsewhere in that building. Equipment may also be located underground — an advantageous option for stealth installations where nearby equipment would either nullify or make the camouflage attempt less successful.

All photos Comp Comm, Inc.

Different types of equipment shelters, above left, and unsheltered equipment with buried cables, right.

Regardless of where the equipment is located, service carriers must have ready access to it, as well as to the antennas. Both antennas and equipment need to be secured from the general public, which is why most sites hosting lattice towers or monopoles have an access road or driveway and a perimeter fence.

While visual impacts are of primary concern for Southampton, wireless communications facilities also have potential health and safety impacts.

There are four areas of health and safety impacts related to wireless telecommunications facilities, as follows:

- *Radio Frequency Radiation (RFR).* There is an ongoing debate among scientists and the general public as to the health risks associated with exposure to RFR from telecommunications facilities. The Federal Telecommunications Act of 1996 has effectively removed municipalities from this debate, because of its provisions stating they do not have the authority to regulate wireless service facilities on the basis of RFR, or to set exposure standards for RFR emissions. What they can do is review and monitor telecommunications facilities for compliance with FCC Guidelines. Many communities require evidence of FCC compliance on a regular basis, typically annually. The Town of Southampton is responsible for monitoring its own compliance with FCC guidelines relative to its Radio Communications System managed by the Town's Police Department.
- *Noise.* Some installations include generators to provide power or backup power in the event of a power outage, and mechanical ventilation to keep equipment operating within an acceptable temperature range. The noise generated by such equipment must be taken into account in the siting, design and review of facilities.
- *Falling Materials.* Antennas mounted at great heights and the artificial branches and foliage found on treepoles are subject to strong winds, which may cause breakage, thereby becoming a falling material hazard to persons and property at the ground level. Structures and antennas may also become covered with ice, pieces of which will fall when melting. Ice falling from a 681-foot guyed lattice tower located on Middle Country Road in Middle Island causes perennial damage to homes in its vicinity. That tower was built in 1984, prior to the proliferation of wireless facilities and the regulatory response by municipalities. Today, wireless communications ordinances typically address these potential hazards through setback requirements (i.e. fall zones) and structural analysis. For treepoles, structural analysis would address wind resistance factors, testing for material strength and stiffness, and a description of the environmental effects related to solar degradation and fatigue. The Town of Smithtown requires compliance with hurricane and tornado design standards.
- *Hazardous Materials.* Hazardous materials typically used in wireless service facilities may include gallium arsenide (a carcinogen), sulfuric acid in batteries, diesel fuel for generators and compressed gases. The quantities found at these facilities are usually not large and do not present a serious threat to life or property. However, they should be reviewed for conformance to the Town's

fire code. Some wireless telecom codes include specific provisions addressing hazardous materials.

V. Existing Conditions: Wireless Sites in and around the Town of Southampton

Five commercial wireless carriers currently operate in Southampton. Most appear to require additional antenna locations to provide full coverage.

Only the AT&T cellular network appears to offer adequate coverage throughout the Town of Southampton, although the network is seeking additional sites to add capacity. AT&T's PCS network, as well as Sprint and Nextel, T-Mobile, and Verizon all have weak areas to varying degrees (see details below).

For this planning effort, the Town commissioned Comp Comm, an engineering consulting firm focused exclusively on wireless technologies, to prepare a series of propagation studies to identify likely weak coverage areas[1]. A propagation study is a mathematical model that calculates and predicts RF signal strength over a geographic area. The studies conducted for Southampton modeled existing coverage strength for each carrier currently providing service in the Town and analyzed the potential to address the identified weaknesses with antennas placed at existing support structures.

While most weak coverage areas appear capable of being remedied through the use of existing structures, a combined propagation study shows that even with full deployment at recommended existing sites, carriers providing PCS service would still have coverage weaknesses along stretches of Rt. 27 in the western and eastern portions of the Town, and in the North Sea area, particularly around Noyack Road. The Town can reasonably expect PCS carriers to need additional sites in these areas to provide coverage. Additionally, all carriers can be expected to seek new installations to expand their networks' capacity, although these may not always require new towers.

Propagation maps showing predicted coverage areas and strengths, and known site locations by carrier are presented in Attachment II, containing the Plan's map series. Study findings are summarized below.

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[1] The Southampton Police Department operates a wireless Radio Communications System with 6Ghz frequency coordination provided by Motorola. The system was not included in the propagation study described here because it is distinct from commercial wireless communications service, and its planning considerations are different. Southampton's public safety Radio Communications System was updated in 2003, based on a computer generated radio coverage prediction survey prepared by Motorola in December of 2001, and provides coverage and reliability that "far exceeds the existing system currently in use" according to the system description documentation. (p.22) The document also notes that "a wide variety of external issues can impact radio coverage at any given moment in any specific location" and does not estimate how long the update will be adequate or project future public safety service needs. It does, however, note features of the new QUANTAR base stations used that make them adaptable to future needs — e.g. they are capable of having new modules added, and of having their software reconfigured. Details of the Town's Radio Communication System, including frequencies used for the various channels, are contained in Motorola's proposal to the Police Department, dated September 9, 2002.

There are 59 existing antenna support structures in and around the Town of Southampton.

The Town and its consultants compiled a list of all known wireless telecommunication sites and towers within the Town, the Villages, and the surrounding area. While a total of 61 sites were identified, two have since been removed (see below). They are presented in this plan in three forms, all of which are located in the Attachments section of this document:

1. A tabular inventory (Attachment I). Columns in this table provide information on site's classification (i.e. lattice tower, monopole, water tower, etc.), property id and ownership, site acreage, height, and carriers hosted. The inventory also assessed each site's potential to host additional carriers.[2]
2. Two location maps (to be found in Attachment II):
    - Map 1 shows the Locations of Towers and Antennas on a standard map showing roads and municipal boundaries;
    - Map 2 provides a Digital Elevation Model (DEM) for the Locations of Towers and Antennas.
3. A photographic inventory with detailed descriptions of each site (Attachment III).

In addition to these existing sites, 9 potential sites were identified through proposals and are shown on Map 3, Proposed Wireless Telecommunications Sites. These sites were considered in the propagation studies, and some are noted as possible coverage solutions in the presentation of Propagation Study Results: Carrier Weak Areas and Potential Solutions, beginning on page 26. However, it should be noted that:

- There are no current applications connected with these sites; and
- They have not yet been through an environmental review and therefore are not endorsed by the Town.

Many existing antenna support structures are either underutilized or not utilized at all.

Of the existing sites identified, less than half support cellular or PCS communications facilities. Instead, they may support antennas for public safety (see the references to the Town's Radio Communications System, elsewhere in this document), radar, FAA communications, AM, FM, VHF/UHF, paging and other telecommunications activities.

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[2] Determining a tower's physical capacity for additional carriers (or tenants) requires a detailed structural analysis of the tower by a structural engineer and the particular configuration to be added to the tower and site. Such analysis would be beyond the scope of this project. Instead, for purposes of the master plan an informed estimate was made as to possible future capacity. A detailed structural analysis would be completed at the time an application would be made to locate antennas on a particular site.

Towers and other support structures currently hosting cellular and/or PCS communications carriers typically offer collocation. Some sites host antennas of all five service carriers.

Some sites were determined to be unusable for new wireless service carriers. These include structures that are already fully used, structures which appeared too weak to support commercial antennas, or in the case of two defunct AM towers (sites 2 and 3), sites which have since been dismantled. Other sites, however, were identified as potentially capable of supporting antennas to address the coverage weaknesses of the Town's wireless communications carriers, and are listed on page 26. Maps 4 through 9 present the locations of existing sites and coverage areas/strengths for each carrier.

A carrier-by-carrier summary follows:

AT&T - Cellular

- Licensed to provide both cellular and PCS service in the Town
- Cellular coverage is adequate, with no areas lacking coverage; company is now seeking to increase capacity
- 17 confirmed antenna sites in or around the Town; 5 possible locations needing confirmation
- Successful stealth installations in the cupola on the Southampton Town Hall and a church steeple in the Village of Westhampton Beach

AT&T - PCS

- 2 confirmed antenna sites in or around the Town; 5 possible locations needing confirmation
- Propagation study was prepared assuming the eventual installation of PCS capabilities at all of AT&T's cellular locations
- With full deployment of antennas at existing AT&T cellular and other identified possible existing structures, AT&T's PCS service would still have three weak coverage areas:
    - a portion of Rt. 27 at the extreme western end of the Town;
    - a shorter portion of Rt. 27 at the extreme eastern end of the Town;
    - an area in North Sea.

T-Mobile

- PCS system has 14 antenna locations in or around the Town
- T-Mobil has current potential coverage weaknesses in 7 locations
- While most weak areas appear capable of being addressed through either collocation or stealth installations on existing structures (e.g. flagpole, church steeple), several would remain. These correspond to the potential weaknesses listed for AT&T PCS service, above

Sprint[3]

- PCS service with 16 antenna sites in and around the Town

[3] It should be noted that Sprint and Nextel are now one company. However, the systems were studied separately, since many phones operate on Sprint or Nextel but not both.

- Potential coverage weaknesses in 9 locations, several of which are similar to service gaps for T-Mobile
- While most weak areas appear capable of being addressed through either collocation or stealth installations on existing structures (e.g. flagpole, church steeple), several would remain. These correspond to the potential weaknesses listed for AT&T PCS and T-Mobile, above

Nextel

- ESMR service with 11 antenna sites in and around the Town
- Potential coverage weaknesses in 2 locations, both of which appear capable of being addressed using existing sites

Verizon

- Cellular service with 12 confirmed and 5 potential antenna sites in and around the Town
- Potential coverage weaknesses in 2 locations, both of which appear capable of being addressed using existing sites

Propagation Study Results: Carrier Weak Areas and Potential Solutions				
Carrier	**Weak Coverage Area**	**Hamlet Area**	**Nearest Existing Antenna Support Structure Locations**	**Potential Antenna Support Solutions**
T-Mobile	1. Along Route 27 near the intersection with Southampton-Riverhead Road	East Quogue, Riverside-Flanders	9	Site 9 is the SCWA Building at 610 Old Riverhead Rd. in East Quogue and has a very light duty 30' pole with a top-mounted whip antenna in back of the building. The area is very open. Sprint and AT&T PCS also have weakness in this area and collocation would be appropriate in the event of a replacement pole or new purpose-built antenna structure.
	2. Along and to either side of North Sea Road and the northern portion of Sandy Hollow Road	North Sea	30, 31, 34	[a] Site 34 is a large lattice tower that may be able to support an additional service carrier; [b] Site 30 is being replaced with a stronger lattice tower or a monopole, which may be able to accommodate additional service carriers.
	3. Great Hill Road area, particularly the western end	Noyack	36-41	[a] Site 36, a 180' self-support lattice tower with AT&T at mid-level and a top-mounted microwave dish, may be able to accommodate one or two more service carriers; [b] Verizon's proposed North Sea flagpole site is in this area and could serve as a potential site for collocation.
	4. The area around Sagaponack Lake	Village of Sagaponack	15, 18	[a] Site 15, a 70' self-support lattice at the Bridgehampton Fire Department, is too light-duty to support the two PCS service carriers (T-Mobile and Sprint) that have coverage problems in the area. However, were the existing lattice tower to be replaced with an 80' monopole, the two current service carriers could be supported along with the existing antennas for the Fire Department. [b] There are potential sites in the area that could provide options for stealth solutions — P-1 (Flagpole) and P-2 (Church Steeple).

Propagation Study Results: Carrier Weak Areas and Potential Solutions				
Carrier	**Weak Coverage Area**	**Hamlet Area**	**Nearest Existing Antenna Support Structure Locations**	**Potential Antenna Support Solutions**
T-Mobile	5. Parts of Noyack	Noyack	45	Site 45 is a 222', 2-guyed tower with supporting bridge structure which appears to have more room for antennas. Its capacity needs to be determined.
	6. Northeast of the intersect of Routes 27 and 2	Hampton Bays	21	Site 21 is a relatively strong self-support tower at the Southampton Police Dept. HQ in Hampton Bays which appears to have space for an additional service carrier – most likely at a lower level.
	7. The southwestern border of the Town with Brookhaven	Eastport	56	Site 56 is a substantial monopole with four or five service carriers. It could not be verified whether or not T-Mobile is already on this monopole. This site appears to be the best solution for T-Mobile in this area.
Sprint	1. Along Route 27 near the intersection with Southampton-Riverhead Road	Northampton, Westhampton, East Quogue	9	Site 9 is the SCWA Building at 610 Old Riverhead Rd. in East Quogue and has a very light duty 30' pole with a top-mounted whip antenna in back of the building. The area is very open. T-Mobile and AT&T PCS also have weakness in this area and collocation would be appropriate in the event of a replacement pole or new purpose-built antenna structure.
	2. Great Hill Road area, particularly the western end	Noyack	36 to 41	[a] Site 36, a 180' self-support lattice tower with AT&T at mid-level and a top-mounted microwave dish, may be able to accommodate one or two more service carriers; [b] Verizon's proposed North Sea flagpole site is in this area.
	3. The area around Sagaponack Lake	Village of Sagaponack	15-18	[a] Site 15, a 70' self-support lattice at the Bridgehampton Fire Department, is too light-duty to support the two PCS service carriers (T-Mobile and Sprint) that have coverage problems in the area. However, were the existing lattice tower to be replaced with an 80'

Propagation Study Results: Carrier Weak Areas and Potential Solutions				
Carrier	**Weak Coverage Area**	**Hamlet Area**	**Nearest Existing Antenna Support Structure Locations**	**Potential Antenna Support Solutions**
Sprint				monopole, the two current service carriers could be supported along with the existing antennas for the Fire Department. [b] There are potential sites in the area that could provide options for stealth solutions — P-1 (Flagpole) and P-2 (Church Steeple).
	4. A small area southwest of Mecox Road	Water Mill	40	Site 40 is a group of five or more tanks owned by Quogue Sinclair Fuel in Water Mill. T-Mobile's panel antennas are spread out along the tank tops, making it somewhat inconvenient for a second service carrier's antennas, though not impossible.
	5. North of Station Road in Westhampton	Westhampton	12, south to 39	[a] Site 12 is a 72' telephone pole at 47 Station Rd., Westhampton, owned by LIPA. While T-Mobile has antennas at the top of the pole, it should be able to accommodate another service carrier's antennas mounted 8' to 10' lower down. [b] Site 39 is St. Mark's Episcopal Church in the Village of West Hampton Beach. AT&T has already taken advantage of this site for its stealth antennas. While it is unlikely this location could accommodate a second service carrier, further investigation is warranted.
	6. Northeast of the intersection of Routes 27 and 2	Hampton Bays	2, 3	Sites 2 & 3 are two defunct AM towers that are planned (and permitted) to be dismantled.
	7. Parts of Noyack	Noyack	45	Site 45 is a 222', two-guyed tower with supporting bridge structure that appears to have more room for antennas.
	8. Along Midhampton Avenue in Quogue	Quogue	16	Nextel is already on site 16 and is now merged with Sprint; the Nextel single band antennas could be replaced with dual band antennas to accommodate Sprint.

Propagation Study Results: Carrier Weak Areas and Potential Solutions				
Carrier	**Weak Coverage Area**	**Hamlet Area**	**Nearest Existing Antenna Support Structure Locations**	**Potential Antenna Support Solutions**
Sprint	9. The vicinity of East Montauk Highway, just west of the Shinnecock Canal	Hampton Bays	23	The situation at site 23 is similar to that of site 16 above.
Nextel	1. Great Hill Road area, particularly the western end	Noyack	36, 41	[a] Site 36, a 180' self-supported lattice tower with AT&T at mid-level and a top-mounted microwave dish, may be able to accommodate one or two more service carriers; [b] Verizon's proposed North Sea flagpole site is in this area and could also serve as a potential site for collocation.
	2. Southeastern border of the Town with Easthampton	Village of Sagaponack	54 and 55	This area is close to the Town of Southampton's border with Easthampton, and may be served by facilities in that town.
Verizon	1. West of Watermill Trowd Road in North Sea	North Sea	36,41	[a] Site 36, a 180' self-supported lattice tower with AT&T at mid-level and a top-mounted microwave dish, may be able to accommodate one or two more service carriers; [b] Verizon's proposed North Sea flagpole site is in this area and may also serve as a potential site for collocation.
	2. Southeastern border of the Town with Easthampton	Village of Sagaponack	54 and 55	This area is close to the Town of Southampton's border with Easthampton, and may be served by facilities in that town.

Propagation Study Results: Carrier Weak Areas and Potential Solutions				
Carrier	**Weak Coverage Area**	**Hamlet Area**	**Nearest Existing Antenna Support Structure Locations**	**Potential Antenna Support Solutions**
AT&T PCS	1. A long stretch of Rt. 27 on the western side of the Town	Eastport, Northampton, Speonk, Remsenberg, Westhampton,	9	Site 9 is the SCWA Building at 610 Old Riverhead Rd. in East Quogue and has a very light duty 30' pole with a top-mounted whip antenna in back of the building. The area is very open. T-Mobile and Sprint also have weakness in this area and collocation would be appropriate in the event of a replacement pole or new purpose-built antenna structure.
	2. A stretch of Rt. 27 on the eastern side of the Town.	Bridgehampton	40, 15, 50	Site 50, an existing 124' monopole, could be used for collocation, and sites 40 and 15 developed as discussed above.

VI. Managing and Monitoring Wireless Telecommunications Facilities

Applications for the installation of wireless communications facilities currently require a building permit and are processed through the Town's Department of Land Management.

Historically, they have been treated comparably to other building applications and have been processed and reviewed by available staff. The propagation maps and inventories of existing and potential antenna support structures contained in this plan were not hitherto available; hence the Town had limited ability to work proactively with service carriers on site location.

The proliferation of wireless telecommunications facilities is relatively recent — encompassing little more than a decade. The technology is continually evolving, and municipal regulations must keep pace.

After the passage of the 1996 Federal Telecommunications Act, many communities passed regulations to control the impact of the new communications facilities whose development the Act intended to encourage. The Town of Southampton responded with its own zoning amendment in 1998. Initially, promoting collocation was the focus of most local regulations, the rationale being that having antennas from competing carriers clustered together on a tower or monopole ultimately reduces the number of such structures needed in a community. Now the sense of the planning community has shifted so that smaller, less obtrusive structures are preferred — even if that means having more of them. Consequently, regulations are being updated to reflect this preference, and to call for other impact reducing strategies such as the use of stealth technology. As industry practices and technologies continue to change, municipal regulations will need to be evaluated to ensure their continued effectiveness, and to promote the replacement of older, visually obtrusive installations with those having smaller impacts.

Municipal regulations are also evolving to address changes in the type and scale of wireless facility applications. While there continues to be interest in, and the need for, major new antenna support structures, carriers are increasingly approaching communities with applications for smaller projects involving the addition of, change in or replacement to equipment on an existing structure. Such projects may or may not warrant the same level of review that an application for a purpose-built structure does, and Southampton planners are currently faced with a lack of regulatory clarity and guidance on how to treat such requests.

A comparative review of local ordinances identified best practices for processing wireless communications facility applications, and for controlling their impacts.

To assist in crafting an updated amendment wireless telecom amendment for the Town of Southampton, the Town's planners and consultants reviewed examples of ordinances from communities in the region and elsewhere. These include models promoted by regional planning commissions. Ordinances differed in both how communities processed and administrated the review of wireless telecommunications facilities and in the dimensional requirements, design standards and other regulations used to manage their impacts. Among the trends identified were:

- Tiered application processes that recognize the changing nature of wireless facility applications and distinguish the levels of review appropriate to projects of different scales — e.g. new tower v. installation on existing structure.
- Identification of "Areas of Opportunity" and "Areas of Avoidance" for siting new facilities.
- Requirements for regular monitoring of radio frequency emissions, as well as noise and structural soundness.
- Imposition of fees to cover application review and ongoing monitoring and inspection.
- Performance bonds are sometimes required to cover the costs of tower removal in the event of abandonment.
- Requirements for applicants to demonstrate the need for the proposed facility, particularly with reference to its location and specific design (e.g. antenna mount type, height, etc.)
- A preference for multiple, less obtrusive installations over large towers supporting several carriers.
- Requirements for camouflaging facilities.
- Requirements for shelter and/or concealment of facility base station equipment.

Because carriers typically lease antenna sites, they can be a potential source of revenue for municipalities, as well as for other property owners in both the public and private sectors.

While wireless facilities present a challenge in terms of impact mitigation, they also provide opportunities for revenue enhancement. As has been noted, the Town of Southampton hosts AT&T antennas in the Town Hall cupola. This is a win-win situation in that the carrier achieves desired coverage in its network while the cupola provides effective camouflage for the antennas and the lease of space generates revenue for the Town.

As carriers seek sites for infill service, support structure requirements may be smaller, allowing antennas to be mounted on such Town-owned property as lamp posts and

traffic signals, as well as on public buildings. Such sites are also suitable for hosting WiFi transmitters (see below). They are given in maps in Attachment II showing Town Facilities and Town Owned Land, Other Public Land, Public Facilities and Tourist Resources, and Town Rights of Way, Utility Corridors and LIPA substations.

Not all Town-owned property is suitable for the development of wireless communications facilities. Land purchased under the Community Preservation Fund program, for example, has deed restrictions that preclude such a use. Land for which the Town has purchased development rights through the Agricultural Preservation program is similarly restricted.

It should also be noted that Town-owned property with the potential to support antennas may not be able to accommodate more than one carrier at a time. Consequently, each facility lease of a site may preclude the use of that facility for other telecommunications purposes. Consideration should be given to identifying the best use of Town-owned sites and to obtaining the best agreements for use of those sites.

County and municipal governments are taking on a more proactive role in the development of wireless communications facilities in order to provide public WiFi service and enhanced public safety.

As noted above, WiFi technology allows people to access the Internet without being connected to a landline telephone or cable. It can allow people to work in public places, and enhances the freedom and flexibility afforded by telecommuting. For Southampton, WiFi access may make it easier for part-time residents to conduct business here, conceivably expanding shoulder and winter season use of second homes, thereby having positive impacts on the local economy. WiFi also offers public benefits in terms of emergency communications, since natural disasters and other catastrophic events can destroy communications infrastructure. After Hurricane Katrina, government officials created a wireless network around one of New Orleans's few remaining Internet connections which allowed rescue workers to communicate using e-mail and Voice over Internet Protocol (VoIP).

Suffolk County has launched an ambitious initiative to provide County-wide WiFi access and has asked the Town in to provide it with a list of assets such as "towers, buildings of two stories or more, and traffic signal poles. These structures would be used to support small WiFi radios that will provide high speed Internet access across the Island."[4] In return for use of these assets, the County states it will "seek free and/or discounted accounts on the network for the asset owners. The more assets a town or village has to offer, the more likely it will be able to get a larger number of free and/or discounted accounts."

Another initiative, noted above under the discussion of radio frequencies used for public safety communications systems, is New York State's plan to create a State-wide, public safety frequency. To do this, the State will attempt to use existing antenna support towers. When new structures become necessary, the State will first look to government owned land, then private property.

[4] Letter from Suffolk County (signatore) to the Town of Southampton (addressee), date-tk.

The maps prepared for this Wireless Communications Plan include several highlighting areas and features relevant to the State and County initiatives. Maps 1 and 2 show the locations of existing towers and antennas; 10-13 show public land potentially suitable for siting new facilities; 16, 18 and 19 identify areas where new facilities are either prohibited or inappropriate; and 22 shows vertical assets (i.e. high points in a structure such as a building or utility pole) that may be used for mounting antennas. The Town of Southampton may at some future point be faced with the decision to utilize such assets for the County's WiFi network or for lease to commercial telecommunications carriers.

VII. Policies & Recommendations for Accommodating Wireless Growth

Minimizing visual impact is Southampton's primary goal concerning the siting of new wireless telecommunications facilities, after safety and legal considerations.

The Town of Southampton is a resort community that depends on tourism and the vacation home industry. Because visual blight from unmanaged wireless installations can adversely affect the Town's substantial aesthetic appeal, its identity as a world class destination, and its economic base, minimizing the visual impacts of new facilities is a high priority. The following policies, regulations and strategies have been crafted to promote this end, as well as to address the goals provided above in Chapter II.

Policies that address location

Policy 1. The Town of Southampton is committed to facilitating access to reliable wireless telecommunications services throughout the Town. It will take a proactive role in protecting the Town from adverse impacts while promoting full service coverage.

By providing guidance and assistance to wireless telecommunications service carriers in the siting and design of new facilities, the Town may be able to promote the use of preferred locations.

Recommendations

1.1 Require pre-application meetings to review, comment on, and guide the siting and design of new facilities.

1.2 Assist carriers in identifying potential locations by maintaining and making available up-to-date inventories of existing and potential antenna support structures. The maps and inventories contained in Attachment II of this plan are a start.

- Inventories should include, but not be limited to, towers, monopoles, tall buildings, steeples, flagpoles, tall signs, outdoor sculptures and monuments, and existing infrastructure capable of supporting antennas and WiFi transmitters (e.g. water towers, light and utility poles, traffic lights, etc.)
- Inventory data should include information on height, material, status (i.e. whether the structure supports existing antennas), site conditions affecting base station equipment, ownership, zoning, special site conditions (e.g. whether it is located in an environmentally sensitive area, viewshed,), the cost and book values of telecommunications equipment etc.

1.3 To facilitate the maintenance of these inventories, require each new wireless facility applicant to provide the Department of Land Management with its own inventory of existing transmission support structures, or sites approved for towers or antennas, of which the applicant is aware that are either within the jurisdiction of the Town or within one mile from its border.

1.4 Identify "areas of opportunity" and "areas of avoidance" for siting wireless telecommunications facilities, along with a preferred hierarchy of locations and installation types. See Attachment V, "Hierarchy of Siting Preferences."

1.5 Designate specific staff to maintain the data described above on existing and potential wireless telecommunications facility sites, and to provide planning assistance to applicants as may be required. In addition to promoting specific "areas of opportunity," such staff would also be charged with discouraging the location of facilities in "areas of avoidance" — e.g. the visually and environmentally sensitive areas shown in Maps 15 through 20 in Attachment II. Such staff may also be made responsible for maintaining information on the compliance of existing facilities with Town code, FCC regulations and other permitting requirements (see below.)

1.6 Update the review and permitting process for wireless facilities in a way that balances requirements for impact mitigation with the desire for expanded service.

- Provide a streamlined process for facilities that meet location and design standards. Establish a tiered system, allowing:
  - administrative review for installations that will have no or minimal impacts, such as new antennas on an existing stealth installation;
  - expedited review for facilities in preferred locations;
  - special exception review for all other facilities.
- Consider establishing an overlay where taller structures may be located.
- Establish restrictions for protecting sensitive areas such as viewsheds, historic districts, critical environmental areas, etc.

1.7 Prohibit the construction of speculative antenna support structures, where full occupancy is not guaranteed. Such towers, when built and not leased, impact a community unnecessarily. The ordinance update should require applicants to demonstrate a commitment from carriers to provide service from the proposed site within three months of facility completion.

Policy 2. Existing structures and buildings are preferred locations for personal wireless service facilities.

Lattice towers, guyed towers, monopoles and similar structures have an industrial appearance directly at odds with Southampton's rural charm. They also disrupt the rural vistas the Town has taken great pains to preserve through its Community Preservation Fund and ambitious open space acquisition. Although they have been necessary to establish wireless telecommunications service in the area, and have been erected throughout the Town, new purpose-built antenna support structures are to be avoided. The optimum location for new antennas is on existing structures, particularly those that can support stealth installations.

Recommendations

2.1 Require applicants for permits to build new antenna support structures to demonstrate there is no feasible alternative.

2.2 As stated above in 1.5, provide streamlined permitting as an incentive for the use of preferred siting. However, although siting facilities on existing buildings and in stealth architectural features is preferred, such streamlining should not forgo the architectural review necessary to ensure quality installations. Therefore, expedited review that includes Architectural Review Board referral is recommended.

Policy 3. A greater number of smaller, less obtrusive structures are preferable to a lesser number of larger, more obtrusive structures.

To assist wireless companies in identifying sites likely to be acceptable in the zoning process, as well as assist Town officials in the review process, the Town has developed a hierarchy of siting preferences. These are given in Attachment V, Hierarchy of Siting Preferences.

Recommendations

The recommendations given for Policy 2, above, are applicable for furthering this policy as well. In addition…

3.1 When appropriate, require applicants to identify alternative feasible sites and installations for comparison, in order to allow both the applicant and the Town to explore trade-offs and identify the least intrusive option. The selection of alternatives should be made in consultation with Town staff.

Policy 4. To the extent feasible, wireless service facilities should be sited in public rights-of-way or other quasi-public locations.

The preference for locating wireless telecommunications in public rights-of-way serves a number of goals simultaneously:

- It facilitates service coverage along transportation corridors, historically a main focus of mobile phone use;
- It helps mitigate visual impact by collocating antennas on existing infrastructure;
- It creates situations for potentially generating revenue from the lease of public property.

Considerations affecting the feasibility of this preferred location include:

- Competing entities — some companies already using the public rights-of-way have contractual rights under franchise agreements with the Town, as in the case of Cablevision.
- Competing uses — public rights-of-way must first accommodate their primary purpose of providing for vehicular and pedestrian traffic before taking on communications and other non-communications uses.

The proposed wireless telecommunications ordinance update includes a provision stating that "The placement of antennas on existing or replacement structures within street, utility or railroad rights-of-way is the preferred alternative in residential neighborhoods, and the feasibility of such placement shall be considered by the city whenever evaluating a proposal for a new transmission support structure." This preference is supported by the Federal Telecommunications Act, which includes a Pole Attachment provision (Pole Attachment Act, 47 U.S.C. § 224) to ensure that telecommunications carriers have access to poles, ducts, conduits and rights-of-way owned or controlled by utility companies.

Recommendations

The recommendations of Policy 1, above, calling for carrier assistance through pre-application meetings, existing and potential site inventories and dedicated staff assistance are all applicable to furthering this policy. Policy 2.2, to provide incentives for preferred siting through streamlined permitting, also applies. In addition:

4.1 Identify Town-owned property most suitable for wireless telecom installations and create incentives for their use through pre-permitting.

Policy 5. Where a given potential site may affect coverage or visual impact both inside the Town and in another jurisdiction, the Town should coordinate with the other jurisdiction to the extent practicable.

Recommendation

5.1 Require applicants to provide an affidavit demonstrating they have made a good faith effort to identify potentially suitable existing structures in neighboring municipalities, when the proposed location is within two

miles of another jurisdiction. The affidavit should include proof that contact was made with the relevant authorities in neighboring municipalities, water districts and fire districts.

5.2 Conduct outreach to neighboring municipalities informing them of the Town's coordination requirements for new wireless facility applications. Suggest they enact similar requirements or, without new regulations, provide reciprocal coordination through review procedures.

Policy 6. Engage in dialogue with the agencies or authorities that control State and Federal properties located within the Town of Southampton to determine future plans for telecommunication facilities; where appropriate, facilitate the integration of planning efforts.

The Town's zoning authority is limited with respect to wireless facilities owned by other governmental entities. Under New York law, the federal government, state government, state urban development corporations, and public schools all enjoy absolute immunity from zoning regulations. Other government entities, such as municipalities and fire districts, are immune for certain actions but not others.

Communication is proposed here as a means of compensating for the Town's lack of authority over such properties as the formerly-private Southampton College, now part of the State University of New York system and known as Stonybrook Southampton.

Additionally, dialogue with the State and County is relevant because of the plans to create a State-wide public safety network and public WiFi network.

Map 12, Other Public Land, identifies the location of federal, state and county property in the Town of Southampton.

Recommendations

This policy is closely related to Policy 1, which calls for the Town to take a proactive role in planning for the development of wireless communications facilities. It would be advanced in conjunction with recommendation 1.3 above, the designation of staff with specific responsibility over such planning.

6.1 Designated staff should develop a contact list of State and County agencies and authorities with control over non-Town owned public land within the Town, identifying the personnel responsible for potentially leasing those sites to wireless telecom carriers.

6.2 Staff should conduct outreach to the contacts identified in 6.1 above to:

- establish communications;

- identify new wireless telecom projects that may affect the Town, and request the opportunity to review and comment on those projects[5]; and
- solicit information for the Town's inventories of existing and potential sites (see Recommendation 1.2). Such contacts should be updated at least annually.

Policies that address aesthetics

Policy 7. Ensure that the best available camouflage techniques are used to minimize the visual impacts of all components of wireless service facilities to the extent practicable.

Policy 2, above, promotes the siting of new facilities on existing structures, particularly where stealth-type installations are possible.

Recommendations

7.1 Require applicants to submit a visual analysis demonstrating whether and how facilities may be shielded from public view or otherwise disguised.

7.2 Require that wireless service facilities blend harmoniously with their surroundings in shape, color, material, and texture.

- Building mounted antennas should be painted to match the exterior of the structure to which they are attached.
- Towers, monopoles and the like should be painted light blue or light grey.

7.3 Require architectural review for all building-mounted and stealth-type installations, and for all installations on historic structures, in historic districts and in business improvement districts. Identify ways to reduce the burden of this additional layer of review.

7.4 Require equipment to be located underground or enclosed in architecturally compatible structures.

7.5 Require security fencing and landscape screening to utilize styles, materials and plant materials found in the immediate vicinity.

7.6 Require applicants utilizing stealth techniques to identify where such techniques are currently in use elsewhere in the Town and neighboring jurisdictions when appropriate.

- Avoid the over-utilization of specific types of stealth installations, such as flagpoles and stealth water towers.

[5] The Town of Southampton would have no jurisdiction over such projects. The requested review would be a courtesy.

- Encourage installations that are hidden in existing architectural features.
- Discourage the use of obviously simulated "stealth" techniques such as counterfeit trees, cupolas that are out of scale with the buildings to which they are attached, etc.

7.7 Prohibit text, logos, images and any other form of advertising or promotional signage on wireless telecommunications facilities.

- Allow for limited signage related to safety and security — i.e. plaques containing identifying information, safety warnings, and emergency access contacts.
- Prohibit the use of commercial flags on stealth flagpole installations.

7.8 Provide for facilities to be exempt from camouflage requirements when they can be demonstrated to be of outstanding, unique and artistic architectural design.

Policy 8. Wireless telecommunications facilities should be scaled to fit harmoniously with the surrounding elements of the site and neighborhood.

The site plan and architectural review processes are instrumental to implementation of this policy.

Recommendations

8.1 Limit the height of new wireless telecommunications facilities to 10 feet above the height of prevailing development, expressed as the average structure height within 100 feet of the proposed facility. When there is no surrounding development, facility height should be measured against the average tree canopy height within the same 100 foot radius of the proposed facility site.

8.2 Prohibit the use of guyed structures.

8.3 Establish limits for the size of antennas and above ground equipment shelters based on type of zoning and land use.

Policy 9. Strengthen the review process through education and training of staff, decision-makers and the general public.

The permit review process is instrumental to carrying out policies that address aesthetic concerns.

Recommendations

9.1 Ensure that Town officials and staff involved in the review and permitting of wireless facilities are aware of the Town's sensitive resources and the options available for protecting them. This plan contains a series of maps included to assist facility site planners and

reviewing officials. They identify aesthetic resources, critical environmental areas, Town rights of way, power lines and substations, public lands and non-government facilities.

9.2 Ensure that Town staff and officials involved in the review and permitting of wireless facilities are familiar with wireless technology advances, particularly in the area of facility design and camouflage techniques. Provide them with access to training through workshops, conferences and seminars (including "webinars").

- Staff with designated responsibility over wireless telecommunications facilities (see Recommendation 1.2) should be charged with identifying and circulating information about appropriate educational opportunities.
- Wireless telecommunications staff should look to the Police Department for in-house resources on wireless communications because of the Department's operation of, and experience with, the Town's Radio Communication System. For example, Motorola has provided the Police Department with resources on developing a program for compliance with FCC regulations.

9.3 Staff should maintain a photo collection of examples of successful screening and camouflage techniques, and otherwise preferred installations.

9.4 Support public involvement in the review process by:

a) making this wireless telecommunications plan generally available through the Town's website;

b) preparing a user-friendly informational brochure or "cut sheet" summarizing the measures taken by the Town to govern the siting, design and ongoing maintenance of wireless telecommunications facilities, and the procedures for public review.

c) providing for expanded public notice requirements for public hearings on proposed new antenna support structures. The area of notification should be larger than what is required for conventional site plan review, to better correspond to the area of visual impact.

Policies that address operations & safety

Policy 10. Wireless communications facilities shall be designed to ensure public safety from radio frequency emissions, physical hazards and nuisance.

Recommendations

10.1 Require new antenna support structures to be designed in compliance with hurricane and tornado building standards.

10.2 Require security fencing with warning signs around all ground-level installations and equipment. Warning signs should be limited in size, and subject to design review for visual impact.

10.3 Require railings around exposed roof-mounted facilities.

10.4 Wireless installations should be accessible for emergency maintenance at all times. Facility signage should contain emergency contact information.

10.5 Protect people and property in the vicinity of antenna support structures from falling ice, structural failure, and similar potential falling dangers by maintaining the separation requirements in the Town's existing wireless telecommunications ordinance. These requirements range from 100 to 300 percent of the height of the structure, depending on type of land use.

10.6 While local authorities cannot enact standards for radio frequency that are more stringent than the FCC's, they can require demonstration of FCC compliance — and the Town of Southampton should do so.

10.7 When mechanical ventilation, power generators or other sources of noise are proposed in personal wireless service facilities, require applicants to demonstrate compliance with the Town's noise ordinance.

Policy 11. The Town will monitor all wireless telecommunications facilities to ensure they are well-maintained and pose no danger.

Recommendations

11.1 Impose a time-limit on permits granted to wireless facilities, requiring renewal every 10 years. Use the permit renewal process to evaluate:

- whether the facility continues to provide necessary coverage or has been made redundant;
- whether new technologies are available to allow for reduced size and/or improved camouflage;
- whether the facility has been maintained in compliance with local and federal regulations. A good compliance record should be made a condition for permit renewal, and for the granting of new facilities in the applicant's network.

11.2 Establish a registry of wireless telecommunications facilities, and require owners of service equipment and antenna support structures to provide periodic reports demonstrating the following:

Reporting Requirement	Frequency
Ownership, utilization status, emergency contact information, cost and book values of equipment	Annually

Compliance with FCC regulations on Radio Frequency Radiation	Annually
Compliance with municipal noise regulations	Annually
Structural soundness of antenna support structures and antenna mounts	With 10-year permit renewal

11.3 When appropriate, require a bond for facility landscape maintenance.

11.4 Provide for annual inspections to ensure that antennas, support structures, landscaping and other camouflage are maintained in good order. Site visits may be conducted by Town building inspectors or, by Town staff specially assigned to manage and monitor the development of wireless telecommunications facilities.

Policy 12. Abandoned facilities shall be removed.

Recommendations

12.1 Require carriers to notify the Town when they cease operations at a specific site. Facilities that have not been in use by any service carrier for a period of 12-months should be subject to abandonment provisions that provide for removal of a facility by the company and/or property owner.

12.2 Require applicants to post bonds to provide for a facility's removal in the event that it ceases to be used removal of a facility by the company and/or property owner.

Policy 13. The permitting, monitoring and inspection and of wireless facilities should be economically self-sustaining.

Recommendations

13.1 The Town should enact permitting fees commensurate with the costs of application review and facility monitoring. Because of the need for on-going review and inspections, fees should be levied annually along with the reports required to maintain the registry described above in 11.2.

- Consider structuring fees to reflect the Town's location policies, with facilities in preferred locations given incentive pricing.
- Fees for antenna support structures (i.e. towers, monopoles) should be levied separately from fees for service antennas.

13.2 The Town should pursue site-lease arrangements with wireless carriers by:

- Identifying suitable Town-owned facilities where wireless antenna installations would be appropriate — i.e. opportunity sites — and that meet carrier needs for coverage.

13.3 The Town should update its property assessment records to ensure that antenna support structures are fully valued as site improvements with the town receiving appropriate tax revenue from them.

- As part of the evaluation process, the Town should research the legality of whether it is permissible to tax antenna support structures that are site improvements on exempt property when such structures are leased to for-profit companies — i.e. tax the value of the improvement but not the land or supporting building (if relevant).

13.4 The Town should continue research into the potential to derive compensation from companies attaching wireless communications equipment to poles owned by the Long Island Power Authority (LIPA) in the Town's public rights-of-way. While the Town's existing franchise agreements with LIPA appear to grant general rights to use the Town's public rights-of-way for any lawful purpose, including subleasing, additional research is needed to determine whether a valid case can be made to distinguish between the right to use the streets and the right to use them for free. If such a distinction is valid, the Town could pursue a fair price for the value LIPA receives from its use of the Town's rights-of-way from subleasing those rights to communications companies.

VIII. Design Guidelines

General

- Stealth installations — i.e. antennas either hidden within existing structures (e.g. church steeples, cupolas) or mounted in new structures designed to look like non-purpose-built towers (e.g. water and fire towers, flag poles, silos) — are preferred.
- Minimize the height and mass of all components.
- Minimize the silhouette of all components.
- Use materials, colors and techniques so that the structure and its components blend in with their surroundings.
- Use existing geographic, topographic, flora (trees, shrubs) or structures so as to conceal the structure and its components, particularly from key vantage points.

Antennas

- If not concealed within a stealth structure, structure-mounted antennas should be camouflaged, either boxed or painted, to blend in with the surrounding structure.
- Pole or tower-mounted antennas should be low profile and flush-mounted, if feasible.
- Roof-mounted antennas, if not concealed within a stealth structure, should be set back in the center of the building, to minimize visibility from the ground.

Antenna Structures (Poles, stanchions)

- Towers shall be minimal height necessary to meet RF objective.
- Flagpoles should be no more than 12" in diameter.
- "Tree" type monopoles are discouraged; if used, they must be of a type and style appropriate to surrounding vegetation.
- No minimum number of carriers is required per tower. If a tower will be less intrusive as a single-carrier tower (no collocation), this is preferred.

Stealth Installations

- New stealth installations should be designed to be comparable in scale to the structures they are intended to appear as — for example, tree-style monopoles should not tower over nearby trees, flag poles should not be substantially larger than typical flagpoles, etc.
- Stealth installations should be constructed of quality materials and should appear as genuine as possible.
- Design should take into account prevailing architectural styles, materials, colors, etc.
- Decisions as to type of stealth structure should be made with consideration to existing stealth installations in the community so as to

avoid an excess of flagpoles, water towers, and the like. Installation types should be varied.

Base Station Equipment

- Base station equipment should be hidden from view by using the following techniques (in order of preference).
  1. Located underground.
  2. Located within an existing adjacent structure or, for building mounted facilities, within the supporting structure.
  3. For rooftop facilities, located within a rooftop structure not more than 10' tall and set back from the perimeter so as to minimize visibility from the street.
  4. Inside purpose-built ground-mounted shelters of a size and style compatible with the surrounding environment (e.g. matching materials, colors, design).
- Ground-mounted equipment must be screened appropriately with landscaping and security fencing.
- Pole-mounted base station equipment should:
  1. not exceed 2' x 3' x 1';
  2. be mounted high enough off the ground so as not to interfere with pedestrian, vehicle and, if appropriate, horse traffic.

Cabling and Cable Runs

- Cabling should be inside the supporting structure (tower or building) and along or under the ground.
- If cable runs are above ground (i.e. in cable trays), they should be camouflaged.
- On lattice towers, cable runs should be bundled and run along a tower leg.

Utilities

- Utilities should be underground where feasible.

Rooftop Installations

- Access to the rooftop and equipment cabinets should be locked or gated.

Facilities located in Historic Districts

- Wireless service facilities located on or within an historic structure shall not alter the character-defining features, distinctive construction methods, or original historic materials of the building.
- Any alteration made to an historic structure to accommodate a wireless telecommunications service facility shall be fully reversible.
- DAS, WiFi and similarly scaled devices typically installed on street lamps shall not be added to historic lighting unless fully stealthed or camouflaged.

Other Requirements

- Lighting should be limited to aircraft warning lights or similar emergency warning lights required by applicable governmental agencies and lighting for

nighttime repairs, which should be on a delay timer to turn off automatically.

- Facilities should have no signage other than that required by applicable governmental agencies (e.g., warning signs, identification signs and emergency contact signs).